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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,818	03/31/2005	Hiroshi Matsui	Q87174	5691

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EXAMINER	
MOWLA, GOLAM	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,818	MATSUI ET AL.	
	Examiner	Art Unit	
	GOLAM MOWLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *7-26 and 32* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,27-31,33 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/31/2005, 09/09/2008, and 06/10/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 7-26 and 32 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 03/20/2009.

Remarks

2. The process steps in claims 3, 4, 30 and 31 have not been given any patentable weight. Examiner notes that the determination of patentability is based on the product, and not on the method of making the product (method of forming the metal circuit (7) or insulating layer (10) by printing method). "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." MPEP §2113. *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964,966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurth (WO00/48212, refer to US 6462266 for translation).

Regarding claim 1 and 4, Kurth discloses an electrode substrate (fig. 1, col. 2, line 26 to col. 3, line 3), comprising:

- a base material (support pane 2);
- a metal circuit layer (conductor lead 7) that is provided on the base material (2); and
- a transparent conductive layer (conductor layer 5) that is electrically connected to the metal circuit layer (7),
- wherein the metal circuit layer (7) is covered by an insulating layer (insulating coating 10).

Regarding claim 2, Kurth further discloses that the insulating layer (10) comprises a material that includes a glass component (glass coating 10) (col. 2, line 45).

Regarding claim 5, Kurth discloses a photoelectric conversion element (photovoltaic cell 1) (fig. 1, col. 2, line 26 to col. 3, line 3), comprising:

- the electrode substrate (combination of layers 2+5+7+10) according to claim 1;
- a counter electrode (conductive layer 6) that is placed facing a side of the electrode substrate (combination of layers 2+5+7+10) above which the transparent conductive layer side (5) is provided; and

- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate (combination of layers 2+5+7+10) (one of ordinary skill in the art realizes that the electrolyte layer is inherently placed between the electrode and counter electrode).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth as applied to claim 2 above, and further in view of Otake et al. (US 4521251).

Applicant is directed above for complete discussion of Kurth with respect to claim 2 above, which is incorporated herein. The reference is silent as to whether the glass component (glass coating 10) is in the form of a paste that contains glass frit.

Otake discloses a glass coating material comprising low-melting glass component (glass coating 10) in the form of a paste that contains glass frit (col. 1, lines 5-15) allows for hermetic sealing/coating (col. 3, lines 3-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the glass component of Otake in the electrode substrate of Kurth as the glass coating material to allow for hermetic sealing/coating of the metal circuit layer, as shown by Otake. In addition, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (WO00/48212, refer to US 6462266 for translation) in view of Nakamura (US 6291763).

Kurth discloses a dye-sensitized solar cell (photovoltaic cell 1) (fig. 1, col. 2, line 26 to col. 3, line 3, and col. 4, lines 53-63) comprising:

- an electrode substrate, comprising a base material (support pane 2), a metal circuit layer (conductor lead 7) that is provided on the base material (2), and a transparent conductive layer (conductor layer 5) that is electrically connected to the metal circuit layer (7), wherein the metal circuit layer (7) is covered by an insulating layer (insulating coating 10);
- a counter electrode (conductive layer 6); and
- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate

(combination of layers 2+5+7+10) (one of ordinary skill in the art realizes that the electrolyte layer is inherently placed between the electrode and counter electrode).

The dye-sensitized solar cell (1) of Kurth inherently has a semiconductor which is provided between the electrode substrate (combination of layers 2+5+7+10) and counter electrode (6). However Kurth does not explicitly show a semiconductor porous film that is provided on a side of the electrode substrate above which the transparent conductive layer side is provided, and a sensitizing dye that is provided on a surface of the semiconductor porous film, and whether the semiconductor porous film is formed above the electrolyte layer.

Nakamura discloses a dye-sensitized solar cell (fig. 1, col. 34, lines 19-34) which exhibits excellent conversion efficiency (col. 2, lines 24-26) wherein a semiconductor porous film (dye sensitized TiO_2 electrode layer 3) and an electrolyte layer (5) are provided on a side of the electrode substrate (glass substrate 1 with a transparent conductor layer 2) above which the transparent conductive layer side (2) is provided, and a sensitizing dye that is provided on a surface of the semiconductor porous film (3), and the semiconductor porous film (3) is formed above the electrolyte layer (5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the dye-sensitized semiconductor porous film of Nakamura in the solar cell of Kurth in order to allow for a device that exhibits excellent conversion efficiency (col. 2, lines 24-26 of Nakamura) as shown by Nakamura.

9. Claims 27-31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (WO00/48212, refer to US 6462266 for translation) in view of Mohri et al (US 4396682).

Regarding claim 27-31, Kurth discloses an electrode substrate (fig. 1, col. 2, line 26 to col. 3, line 3), comprising:

- a base material (support pane 2);
- a metal circuit layer (conductor lead 7) that is provided on the base material (2); and
- a transparent conductive layer (conductor layer 5) that is electrically connected to the metal circuit layer (7),
- wherein the metal circuit layer (7) is covered and insulated by an insulating layer (insulating coating 10).

Kurth further discloses that the insulating layer coating comprises glass coating (col. 2, line 45). However, the reference is silent as to whether the insulating layer coating includes at least one of alumina, zirconia and silica heat-resistant ceramic, and whether the insulating layer contains at least one of silicate, phosphate, colloidal silica, alkyl silicate, and metal alkoxide.

Mohri teaches an insulating layer (glazed ceramic substrate) for use in electronic device comprises a heat-resistant ceramic (alumina) as a main component and further includes colloidal silica (SiO_2) (see abstract, and col. 2, line 26 to col. 3, line 55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the insulating coating layer of Mohri in the solar cell

of Kurth because the insulating layer of Mohri has excellent high-temperature stability (see abstract of Mohri). In addition, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Regarding claim 33, Kurth in view of Mohri discloses a photoelectric conversion element (photovoltaic cell 1) (fig. 1, col. 2, line 26 to col. 3, line 3), comprising:

- the electrode substrate (combination of layers 2+5+7+10) according to claim 27;
- a counter electrode (conductive layer 6) that is placed facing a side of the electrode substrate (combination of layers 2+5+7+10) above which the transparent conductive layer side (5) is provided; and
- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate (combination of layers 2+5+7+10) (one of ordinary skill in the art realizes that the electrolyte layer is inherently placed between the electrode and counter electrode).

10. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (WO00/48212, refer to US 6462266 for translation) in view of Mohri et al. (US 4396682), and further in view of Nakamura (US 6291763).

Kurth discloses a dye-sensitized solar cell (photovoltaic cell 1) (fig. 1, col. 2, line 26 to col. 3, line 3, and col. 4, lines 53-63) comprising:

- an electrode substrate, comprising a base material (support pane 2), a metal circuit layer (conductor lead 7) that is provided on the base material (2), and a transparent conductive layer (conductor layer 5) that is electrically connected to the metal circuit layer (7), wherein the metal circuit layer (7) is covered by an insulating layer (insulating coating 10);
- a counter electrode (conductive layer 6); and
- an electrolyte layer or charger transfer layer (col. 4, lines 53-63) that is provided between the counter electrode (6) and the electrode substrate (combination of layers 2+5+7+10) (one of ordinary skill in the art realizes that the electrolyte layer is inherently placed between the electrode and counter electrode).

The dye-sensitized solar cell (1) of Kurth inherently has a semiconductor which is provided between the electrode substrate (combination of layers 2+5+7+10) and counter electrode (6). However Kurth does not explicitly show a semiconductor porous film that is provided on a side of the electrode substrate above which the transparent conductive layer side is provided, and a sensitizing dye that is provided on a surface of the semiconductor porous film, and whether the semiconductor porous film is formed above the electrolyte layer.

Nakamura discloses a dye-sensitized solar cell (fig. 1, col. 34, lines 19-34) which exhibits excellent conversion efficiency (col. 2, lines 24-26) wherein a semiconductor porous film (dye sensitized TiO_2 electrode layer 3) and an electrolyte layer (5) are provided on a side of the electrode substrate (glass substrate 1 with a transparent

conductor layer 2) above which the transparent conductive layer side (2) is provided, and a sensitizing dye that is provided on a surface of the semiconductor porous film (3), and the semiconductor porous film (3) is formed above the electrolyte layer (5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the dye-sensitized semiconductor porous film of Nakamura in the solar cell of Kurth in order to allow for a device that exhibits excellent conversion efficiency (col. 2, lines 24-26 of Nakamura) as shown by Nakamura.

Kurth further discloses that the insulating layer coating comprises glass coating (col. 2, line 45). However, the reference is silent as to whether the insulating layer coating includes at least one of alumina, zirconia and silica heat-resistant ceramic, and whether the insulating layer contains at least one of silicate, phosphate, colloidal silica, alkyl silicate, and metal alkoxide.

Mohri teaches an insulating layer (glazed ceramic substrate) for use in electronic device comprises a heat-resistant ceramic (alumina) as a main component and further includes colloidal silica (SiO_2) (see abstract, and col. 2, line 26 to col. 3, line 55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the insulating coating layer of Mohri in the solar cell of Kurth in view of Nakamura because the insulating layer of Mohri has excellent high-temperature stability (see abstract of Mohri). In addition, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-F, 0900-1700 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795